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REISSUE PATENT

Attorney Docket
No. 7311-24RE

Assistant Commissioner for Patents
Washington, D.C. 20231

Transmitted herewith for filing is the reissue utility patent application for U.S. Patent 5,509,546 of Inventor: Robert H. Staat, which issued on April 23, 1996

For: MAGNETICALLY-ACTUATED COUPLER FOR MODEL RAILROAD CARS

Enclosed are:

- ☒ Specification and claims with executed Declaration of Robert H. Staat Under 37 C.F.R. § 1.175.
- ☐ Specification and claims with unsigned reissue Declaration.
- ☒ No change in the drawings, upon which the original patent was issued, are to be made.
- ☒ Letter to Transfer Drawing, plus two copies.
- ☒ Photocopy of U.S. Letters Patent 5,509,546, dated April 23, 1996.
- ☐ An assignment of the invention to _____.
- ☐ A certified copy of Application No. _____.
- ☐ A verified statement to establish small entity status under 37 CFR § 1.9 and 37 CFR § 1.27.
- ☒ Information Disclosure Statement.
- ☒ Preliminary Amendment
- ☒ Offer to Surrender under 37 C.F.R. § 1.178
- ☒ Assent of Assignee to Reissue
- ☒ Revocation and Appointment of Attorney

The filing fee has been calculated as shown below:

			SMALL ENTITY			LARGE ENTITY	
CLAIMS	NO. FILED	NO. EXTRA	BASIC FEE: \$395.			BASIC FEE: \$790	
Total	8-20 =	0	X11	\$	OR	X22	\$
Independent	2 - 3 =	0	X41	\$	OR	X82	\$
Multiple Dependent Claims Present			\$135	\$	OR	\$270	\$
			TOTAL	\$	OR	TOTAL	\$790

The Commissioner is hereby authorized to charge payment of the following fees or credit any overpayment to Deposit Account No. 16-0235. Two additional copies of this sheet are enclosed.

- ☒ The above calculated filing fee of **\$790.00**
- ☐ Assignment recording fee (**\$ 40.00**).
- ☒ Any additional fees required under 37 C.F.R. §1.16 or §1.17.
- ☒ If the filing of any paper during the prosecution of this application requires an extension of time in order for the paper to be timely filed, applicant hereby petitions for the appropriate extension of time pursuant to 37 C.F.R. §1.136(a).

Respectfully submitted,

23 December 1997 By: _____
(Date)

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Enclosures

BACKGROUND OF THE INVENTION

This invention relates to model railroad equipment. More specifically, this invention relates to model railroad couplers which automatically couple and magnetically uncouple model railroad cars.

Model railroaders have developed various couplers for use in the coupling and uncoupling of model railroad equipment. One commonly used coupler is a hook-type coupler. Couplers of this type have been used with all scales of model railroad equipment including the more popular models adapted for use with "HO" gauge.

A number of other similar magnetically activated uncoupling systems for use with model railroad equipment have been disclosed for example in U.S. Pat. Nos. 4,335,820, 3,942,648, 3,840,127, 3,564,766 and 3,469,713.

A number of problems exist with these coupling and uncoupling systems including the large number of parts necessary for each system, the difficulty of working with the small size of these parts, specific problems associated with some of the metallic spring elements which are key to some of the uncoupling systems, the unrealistic look of some of these uncoupling systems when compared with existing railroad equipment and the unreliability of some of the elements of these uncoupling systems.

It is a further object of this invention to provide a magnetic uncoupling system which is easy to assemble and use.

It is a still further object of this invention to provide a magnetic uncoupling system which is realistic looking when compared with existing full scale train equipment.

It is a still further object of this invention to provide a magnetic uncoupling system which contains a reliable centering system for the uncoupling system.

It is a still further object of this invention to provide a magnetic uncoupling system which uses a pivoting knuckle system urged to a closed position by a cantilever spring.

These and other objects and features of the present invention will become apparent to those skilled in the art from a consideration of the following detailed description, drawings and claims. The description along with the accompanying drawings, provides a preferred selected example of construction of the device to illustrate the invention.

SUMMARY OF THE INVENTION

In accordance with the present invention there is provided a magnetically-actuated coupling and uncoupling coupler (10) for attachment to existing model railroad equipment comprised of a drawbar (12) with first (14) and second (16) ends, wherein said drawbar is pivotally mounted at one end of a model railroad car, wherein an integral element of the drawbar which is secured to the first end of the drawbar is an integral leaf spring (18) to center the drawbar (12) within a coupler pocket (20) in an end of said model railroad car, a coupler head (22) with integral cantilever spring (24) secured to the second end (16) of said drawbar, a coupler knuckle (26) pivotally attached to the second end (16) of the drawbar such that the coupler knuckle (26) interacts with the cantilever spring (24) of the coupler head (22) to urge the coupler knuckle to a centered, closed position, and a magnetically-activated pivot post (28) descending from said second end (16) of the drawbar, wherein said post is secured to the coupler knuckle (26) such that when said magnetically-activated pivot post (28) is pivoted by magnetic activation it opens the coupler knuckle.

BRIEF DESCRIPTION OF THE DRAWINGS

This invention will now be described with reference to the accompanying drawings in which

FIG. 1 is a view of a model railroad car with coupler system in place.

FIG. 2 is a top view of the drawbar.

FIG. 3 is a side view of the drawbar.

FIG. 4 is an end view of the drawbar.

FIG. 5 is a top view of the coupler knuckle.

FIG. 6 is a left side view of the coupler knuckle.

FIG. 7 is a top view of the coupler knuckle attached to the drawbar.

FIG. 8 is a left side view of the coupler knuckle attached to the drawbar.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Although the invention is adaptable to a wide variety of uses, it is shown in the drawings for purpose of illustration as embodied in a magnetically-actuated coupler system for model railroad cars comprised of a magnetically-actuated coupler (10) attached to one end of a model railroad car. See FIG. 1.

The magnetically-actuated coupler (10) is generally comprised of a coupler body comprised of a drawbar (12) with first (14) and second (16) functional ends, (these are referred to mesial and distal respectively), a coupler knuckle (26) and a magnetically-actuated pivot post (28). See FIG. 8. The

Mounted in the coupler pocket (20) of the model railroad car is the first (14) or mesial end of the drawbar. The mesial end of the drawbar is attached to a central pivot post (38) within the coupler pocket (20) by placing an opening (36) in the first end (14) of the drawbar over the central pivot post (38) to secure it in place. The first end (14) of the drawbar is urged to a central or coupling position by an integral leaf spring (18) which extends away from the first end (14) of the drawbar (12) and then wraps back around both sides of the first end (14) of the drawbar and forms the shape of a "C" within the coupler pocket (20). See FIG. 2. This C-shaped leaf spring (18) which extends to both side edges of the coupler pocket (30) returns the drawbar (12) to center in response to any lateral thrust or movement. This leaf spring (18) is an improvement over earlier combination leaf springs and spurs as it is of one-piece construction and is an integral component of the drawbar (12).

An integral element of the drawbar, which is secured to the drawbar just back of the coupler head, is the cantilever spring (24) which curves slightly away from the coupler body. See FIGS. 2 and 7. This cantilever spring is manufactured as an integral element of the drawbar (12) and is comprised of a thin, resilient piece which extends forward approximately 6.0 mm to about 1.0 mm of the end of the coupler knuckle. This cantilever spring is preferably prepared from engineering plastic and is an integral part of the casting comprising the drawbar (12).

Extending through the coupler head is the magnetically sensitive pivot post (28) which extends upward through both the second end (16) of the drawbar and the coupler knuckle (26). It pivots freely within the drawbar (12) but is firmly secured to the coupler knuckle (26). See FIGS. 3, 4 and 8. This pivot post (28) descends downward away from the coupler body. As the post descends downward it bends

forward so that it extends laterally to the model railroad car and is positioned just off center of the longitudinal center line of any magnet which may be placed between the rails of the railroad track when the coupler knuckle (26) is in the closed position. See FIG. 3. When magnetically activated, the pivot post pivots outwardly toward the rails of the track.

Pivotaly connected to the post is the hook-shaped coupler knuckle (26). See FIGS. 5 and 6. The hook-shaped coupler knuckle is preferably of one-piece construction and is secured via a knurled friction fit to the post such that it will pivot as the pivot post (28) pivots. See FIGS. 3 and 4. The tip (46) of the hook-shaped coupler knuckle located away from the post contains a lip (50) to resist the decoupling of the model railroad cars and locomotives when the train is under tension of movement. This lip (50) tends to keep the cars coupled except when there is no tension on the opposing couplers and when the pivot posts are magnetically activated to draw the coupler knuckles apart and decouple the model railroad cars or locomotives.

The coupler pocket (20) is provided preferable on both ends of a model railroad car or locomotive into which the complete coupler (10) will be attached. The bottom side of the coupler pocket opening is closed by means of a cover plate (32). The magnetically actuated coupler (10) is generally secured into the coupler pocket (20) by placing the opening in the mesial end (14) of the drawbar (12) over a coupler pocket post (38) which extends downward within the coupler pocket. The complete assembly can be affixed to the model railroad car or locomotive by a number of systems including a screw (34) which extends upward through the coupler pocket post (38) into the lower body of the car or locomotive, a pair of screws through ears on each side of the coupler box or by adhesive securing of the pocket to the underside of the model.

In operation, the cantilever spring (24) which is an integral part of the drawbar (12) tends to force the hook-shaped coupler knuckle (26) to a closed position and thus, assist in keeping the hook-shaped coupler knuckle (26) coupled with an opposite directed coupler knuckle of an opposing model railroad car or locomotive unless acted on by a magnet to open the hook-shaped coupler knuckle (26) by the movement of the magnetically-actuated pivot post (28). The cantilever spring (24) is a significant improvement over the coiled spring returns used on previous products because the force of the cantilever spring is applied tangentially to the coupler head rather than circumferentially. Additionally, the spring is an integral part of the coupler body facilitating ease of manufacture and greatly reducing or eliminating the model maker's frustration of continual replacement of dislodged and/or lost metallic coil springs.

To effectively decouple the models equipped with the device described herein, a laterally polarized magnet is preferably placed stationarily between the rails of model railroad track. The polarity of the magnets preferably is parallel to the rails with the poles being continuous along the side edges thereby causing the magnetically-actuated post to pivot outwardly when activated by the magnet. As the pivot post pivots outwardly, it rotates the hook-shaped coupler knuckle (26) outwardly thus opening the coupler (10). The opposing pole of the magnet located between the tracks concomitantly urges the post of the interrelated coupler to decouple in the opposite direction from the first coupler. As the hook-shaped coupler knuckle (26) pivots away from the oppositely directed coupler, the body of the hook-shaped coupler impacts the cantilever spring (24) of the coupler head (22). The amount of pressure placed on the coupler head (22) by the cantilever spring (24) increases as the

distance that the hook-shaped coupler is pivoted increases. When not activated by a magnet, the cantilever spring (24) tends to urge the coupler knuckle (26) inwardly toward a closed position, thus maintaining the coupled integrity of the train.

The leaf spring (18), which is an integral part of the drawbar (12), located at an opposite end from the coupler knuckle permits the coupler (10) to pivot back and forth within the coupler pocket either as the coupler is acted upon by a magnetic force or as the model railroad car moves along the tracks even on curved sections. Thus, the model railroad cars stay coupled while still moving along the tracks until the uncoupling system is activated by magnets located between the tracks. When decoupled and no longer subject to a magnetic force from between the rails, the leaf spring (18) centers the coupler head in a position for interaction with a second opposing coupler to achieve the coupled condition as the two couplers are gently nudged together.

I claim:

1. A magnetically-actuated coupler assembly for a model railroad car comprising

- (a) a drawbar with first and second ends, capable of being pivotally mounted within a coupler pocket in the end of a model railroad car,
- (b) formed as an integral part of the first end of the drawbar is a leaf spring extending from the first end of the drawbar,
- (c) secured to the second end of the drawbar is a coupler head, wherein the coupler head contains a pair of stops which limit the movement of a pivotally mounted coupler knuckle,

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- (d) a cantilever spring formed as an integral part of the drawbar located proximal from the coupler body,
- (e) a magnetically-actuated post pivotally secured to the drawbar which extends downward from the drawbar, and
- (f) the pivotally mounted coupler knuckle is pivotally secured to the second end of the drawbar such that it is in constant interaction with the cantilever spring to urge the coupler knuckle to a closed or coupled position.

2. The magnetically-actuated coupler assembly of claim 1 wherein the leaf spring is secured to the first end of the drawbar and extends outward and around the first end of the drawbar to form generally a C-shape.

3. The magnetically-actuated coupler assembly of claim 1 wherein an outer tip of the coupler knuckle contains a lip which extends inward toward the post.

4. The magnetically actuated coupler assembly of claim 1 wherein the drawbar includes an extension lip, extending from the drawbar.

5. The magnetically actuated coupler assembly of claim 1 wherein the coupler knuckle contains a slot, an edge of which interacts with one of the stops of the coupler head to limit the capability of the coupler knuckle to open.

[57]

ABSTRACT

A magnetically actuated coupling and uncoupling system for model railroads comprised of a drawbar pivotally-mounted to one end of a railroad car, wherein the drawbar contains an integral leaf spring extending from the first end of the coupler to tend to center the drawbar, a coupler body with cantilever springs secured to the second end of the drawbar, a magnetically-actuated post pivotally-secured to the drawbar extending downward from the drawbar, and a pivotally-mounted coupler knuckle secured to the post and pivotally secured to the drawbar such that the pivotally-mounted coupler knuckle will interact with the cantilever spring.

2025 RELEASE UNDER E.O. 14176

DECLARATION AND POWER OF ATTORNEY
(Reissue Application)

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed in patent number 5,509,546, granted April 23, 1996, and for which a reissue patent is sought on the invention entitled:

MAGNETICALLY-ACTUATED COUPLER FOR MODEL RAILROAD CARS
the specification of which

☒ [X] is attached hereto.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to herein.

I acknowledge the duty to disclose information which is material to patentability in accordance with Title 37, Code of Federal Regulations, Section 1.56.

I verily believe the original patent to be wholly or partially inoperative or invalid, by reason of the patentee claiming more or less than he had the right to claim in the patent. At least one excess or insufficiency in the claims is specified below.

Applicant discovered that issued claim 1 claims more than Applicant has a right to claim. A magnetically-actuated coupler assembly for a model railroad car having a pair of limit stops on the coupler head for limiting the movement of a coupler knuckle was known prior to applicant's invention.

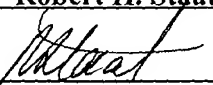
The error described above arose without any deceptive intention on the part of the applicant.

As a named inventor, I hereby appoint Ronald L. Panitch, Registration No. 22,825; William W. Schwarze, Registration No. 25,918; Alan S. Nadel, Registration No. 27,363; Leslie L. Kasten, Jr., Registration No. 28,959; Joel S. Goldhammer, Registration No. 22,130; John Jamieson, Jr., Registration No. 29,546; Martin G. Belisario, Registration No. 32,886; Lynda L. Calderone, Registration No. 35,837; Steven H. Meyer, Registration No. 37,189; Randolph J. Huis, Registration No. 34,626; Clark A. Jablon, Registration No. 35,039; Christopher Egolf, Registration No. 27,633; Kathryn Doyle Leary, Registration 36,317; Gary D. Colby, Registration No. 40,961; and Catherine M. Joyce, Registration No. 40,668, as my attorneys or agents with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

Address all correspondence to **PANITCH SCHWARZE JACOBS & NADEL, P.C.**, One Commerce Square, 2005 Market Street, 22nd Floor, Philadelphia, Pennsylvania 19103-7086. Please direct all communications and telephone calls to **RANDOLPH J. HUIS** at 215-965-1302.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole
or first inventor Robert H. Staat

Inventor's Signature 

Date 12/21/97

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Citizenship United States of America

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Goshen, KY 40026

EXPRESS MAIL LABEL NO. EM000422233US

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Reissue Application No. :
: Group Art Unit:
Filed: Herewith :
: Patent No.: 5,509,546 : Examiner:
Granted: April 23, 1996 :
Patentee: Robert H. Staat :
: Title: MAGNETICALLY-ACTUATED : Attorney Docket No.
COUPLER FOR MODEL RAILROAD : 7311-24 RE
CARS :

LETTER TO TRANSFER DRAWING

Please transfer the formal drawings from Application No. 292,880, filed on August 19, 1994, which issued on April 23, 1996 as U.S. Patent 5,509,546 to the present reissue application, the specification of which is attached hereto.

Respectfully submitted,

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BY: 

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EXPRESS MAIL LABEL NO. EM000422233US

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

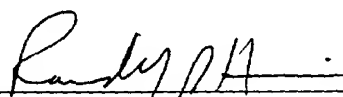
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: Group Art Unit:
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Respectfully submitted,

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RJH/dcm

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Reissue Application of No.	: Group Art Unit:
		:
Filed:	Herewith	:
		:
Patent No.:	5,509,546	: Examiner:
Granted:	April 23, 1996	:
Patentee:	Robert H. Staat	:
		:
Title:	Magnetically-Actuated Coupler For	: Attorney Docket
	Model Railroad Cars	: No. 7311-24RE

PRELIMINARY AMENDMENT

Prior to examination, please amend the application as follows.

In The Claims:

Please cancel claim 1.

Please amend the claims as follows:

2. (Amended) The magnetically-actuated coupler assembly of claim [1] 6 wherein the leaf spring is secured to the first end of the drawbar and extends outward and around the first end of the drawbar to form a C-shape.

3. (Amended) The magnetically-actuated coupler assembly of claim [1] 6 wherein the outer tip of the coupler knuckle contains a lip which extends inward toward the post.

4. (Amended) The magnetically-actuated coupler assembly of claim [1] 6 wherein the drawbar includes an extension lip, extending from the drawbar.

5. (Amended) The magnetically actuated coupler assembly of claim [1] 6 wherein the coupler knuckle contains a slot, an edge of which interacts with one of the stops of the coupler head to limit the capability of the coupler knuckle to open.

Please add the following claims:

-- 6. A magnetically-actuated coupler assembly for a model railroad car comprising:

(a) a drawbar with first and second ends, capable of being pivotally mounted within a coupler pocket of a model railroad car;

(b) a leaf spring formed as an integral part of the first end of the drawbar which extends from the first end of the drawbar;

(c) a coupler head secured to the second end of the drawbar,

(d) a cantilever spring formed as an integral part of the drawbar located proximal from the coupler body,

(e) a magnetically-actuated post pivotally secured to the drawbar which extends downward from the drawbar, and

(f) a pivotally mounted coupler knuckle, pivotally secured to the second end of the drawbar such that it is in constant contact with the cantilever spring to urge the coupler knuckle to a closed or coupled position, the cantilever spring having a first portion which curves away from the coupler body and a free end curves back toward the coupler knuckle to apply a tangential force to the coupler knuckle.

7. The magnetically-actuated coupler knuckle of claim 6 wherein the cantilever spring is molded from engineering plastic.

8. The magnetically-actuated coupler knuckle of claim 6 wherein the cantilever spring and the leaf spring are molded from engineering plastic as a unitary piece with the drawbar.

9. A magnetically-actuated coupler assembly for a model railroad car comprising:
a drawbar capable of being pivotally mounted within a coupler pocket of a model railroad car, the drawbar including a first end having a leaf spring formed as an integral part thereof which extends from the first end of the drawbar, a coupler head formed on a second end of the drawbar, and a cantilever spring formed as an integral part of the drawbar extending from the drawbar adjacent to the coupler head;

a pivotable coupler knuckle secured to the coupler head; and

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a magnetically-actuated post which pivotally secures the coupler knuckle to the coupler head, the magnetically-actuated post being pivotally connected to and extending downwardly from the coupler head, the coupler knuckle being in constant contact with the cantilever spring to urge the coupler knuckle to a closed or coupled position, the cantilever spring having a first portion which curves away from the drawbar and a free end which curves back toward the coupler knuckle to apply a tangential force to the coupler knuckle, such that the magnetically-actuated coupler is assembled from three parts.--

REMARKS

Claims 2-9 are currently pending in this reissue application, as amended. By this Amendment, Applicant has cancelled claim 1, amended claims 2-5 and added new claims 6-9.

The amendments to claims 2-5 are to change the dependency to new independent claim 6. New independent claim 6, paragraphs (a)-(f) are similar to cancelled claim 1, except in paragraph (c), the recitation regarding the coupler head containing a pair of stops has been removed. Paragraph (f) has also been changed to recite that the cantilever spring has a first portion which curves away from the coupler body and a first end which curves back toward the coupler knuckle to apply a tangential force to the coupler knuckle. This is supported by the original specification at column 3, lines 51-60 as well as in Figs. 2 and 7 of the drawings. New claim 7 recites that the cantilever spring is molded from engineering plastic. This is supported in the specification at column 3, lines 57-60. New claim 8 depends from claim 6 and recites that the cantilever spring and the leaf spring are molded from engineering plastic as a unitary piece with the draw bar. This is supported by Figs. 2 and 7 of the drawings and the specification at column 3, lines 17-20 and 57-60.

New independent claim 9 recites a draw bar which is pivotably mounted within a coupler pocket of a model railroad car, with the draw bar including a first end having a leaf spring formed as an integral part thereof which extends from the first end of the draw part, a coupler head formed on the second end of the draw bar, and a cantilever spring formed as an integral part of the draw bar extending from the draw bar adjacent to the coupler head. This is supported at column 3, lines 5-21 and lines 51-60 as well as in the drawing. Claim 9 further recites that a pivotable coupler knuckle is secured to the coupler head. This is supported by the original specification at column 4, lines 7-11 as well as in Figs. 3 and 4. Claim 9 further recites that a magnetically-actuated post pivotably secures the coupler knuckle to the coupler head, with the magnetically-actuated post being

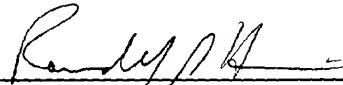
pivotably connected to and extending downwardly from the coupler head. This is supported by the specification at column 3, line 61 - column 4, line 6 and the drawings.

Claim 9 further recites that the cantilever spring has a first portion which curves away from the draw bar and a free end which curves back toward the coupler knuckle to apply a tangential force to the coupler knuckle, such that the magnetically-actuated coupler is assembled from three parts. This is supported by column 3, lines 51-60; column 4, lines 43-50, as well as the drawings.

Prompt consideration and allowance of this application are respectfully requested.

Respectfully submitted,

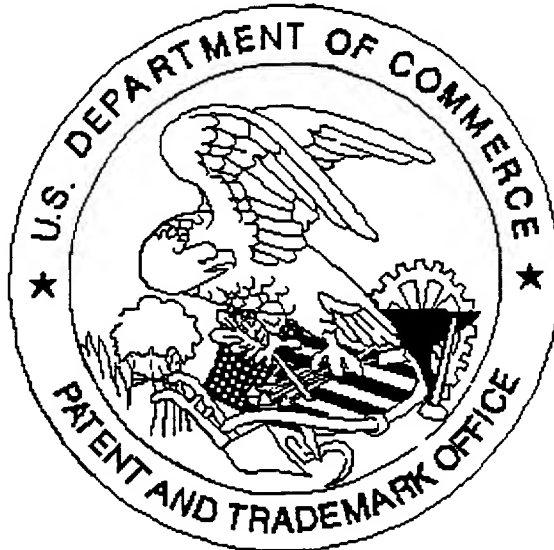
ROBERT H. STAAT

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Enclosure

United States Patent & Trademark Office

Office of Initial Patent Examination -- Scanning Division



Application deficiencies found during scanning:

1. Application papers are not suitable for scanning and are not in compliance with 37 CFR 1.52 because:
 - ☐ All sheets must be the same size and either A4 (21 cm x 29.7 cm) or 8-1/2" x 11". Pages _____ do not meet these requirements.
 - ☐ Papers are not flexible, strong, smooth, non-shiny, durable, and white.
 - ☐ Papers are not typewritten or mechanically printed in permanent ink on one side.
 - ☐ Papers contain improper margins. Each sheet must have a left margin of at least 2.5 cm (1") and top, bottom and right margins of at least 2.0 cm (3/4").
 - ☐ Papers contain hand lettering.
2. Drawings are not in compliance and were not scanned because:
 - ☐ The drawings or copy of drawings are not suitable for electronic reproduction.
 - ☐ All drawings sheets are not the same size. Pages must be either A4 (21 cm x 29.7 cm) or 8-1/2" x 11".
 - ☐ Each sheet must include a top and left margin of at least 2.5 cm (1"), a right margin of at least 1.5 cm (9/16") and a bottom margin of at least 1.0 cm (3/8").
3. Page(s) _____ are not of sufficient clarity, contrast and quality for electronic reproduction.
4. Page(s) _____ are missing.
5. OTHER: NO Drawings